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ing is reduced to a condition suitable for combustion." I do not pretend to put my results, founded entirely on general reasoning, on the same footing as the careful researches and experiments of Professor Seegen, but it seems to me so explicit a statement deserves recognition.

Again Professor Seegen draws attention to the fact that fasting animals still continue to make liver-sugar and that therefore this function *is continuous*. In the same paper I state that waste tissues being albuminoid are undoubtedly eliminated in the same way, *i. e.*, by splitting in the liver into a carbo-hydrate *which is burned* and an incombustible nitrogenous residue to be eliminated mostly by the kidneys. The researches of Schiff[1] demonstrate that waste tissue undergo some important, yea necessary, change in the liver, but as to the nature of the change he says nothing. If the disposal of waste is connected with sugar making, as I affirm, this fact entirely explains the continuity of the function.

Again Professor Seegen says: "The formation of peptones (at least in carnivores not growing) is mostly to form sugar." I say, "The whole albuminoid-excess is split into sugar to be burned for vital force and vital heat and an incombustible residue to be otherwise eliminated, *i. e.*, the whole albuminoid-excess is utilized as sugar."

As to the experiments of Professor Seegen and others showing that with carbo-hydrate diet the sugar in the portal vein is less than in hepatic vein, I confess they are wholly unintelligible to me. What becomes of the sugar which is absorbed in such large quantities? Is it not possible that it may be present in some form which does not respond to the ordinary tests for glucose?

The final conclusion of Professor Seegen that *glycogen* always present in the liver *is not the source of liver-sugar*, must be established on very firm basis before it will be accepted by physiologists.—*Joseph LeConte.*

BERKELEY, CAL., *April 8, 1886.*

PSYCHOLOGY.

MEYNERT'S PSYCHIATRY,[2] VOL. I.—This volume of 285 pages is largely devoted to the gross and minute anatomy of the brain. Besides the appendix on the mechanism of expression, and a short chapter on the nutrition of the brain, two-thirds of the book are devoted to anatomy and one-third to the physiology of this important organ. The work represents the results of Meynert's researches up to 1884, and is of first-class value as embracing the

[1] Arch. des Sciences, Vol. 58, p. 203, 1877.

[2] Psychiatry, a clinical treatise on diseases of the Fore-brain. By Theodor Meynert, M.D., professor of nervous diseases and chief of psychiatric clinic of Vienna. Translated by B. Sachs, M.D. Vol. I. New York, G. P. Putnam's Sons. 8vo, 1885.

descriptions of a master in cerebral anatomy and physiology. The text is accompanied by mostly excellent engravings, which are so necessary to the comprehension of this abstruse subject. We give some of these, Figs. 1, 2 and 3 (Nos. 9, 24 and 56 of the book) which represent structure, and Fig. 4 (60) which illustrates the law of muscular action under stimulus.

Meynert opens his chapter on the physiology of the brain with the assertion (p. 138) that it is an organ of which the function may be inferred from its structure. This inference is justified by facts of physiology both normal and abnormal. The most important normal physiological law which is adduced in evidence,

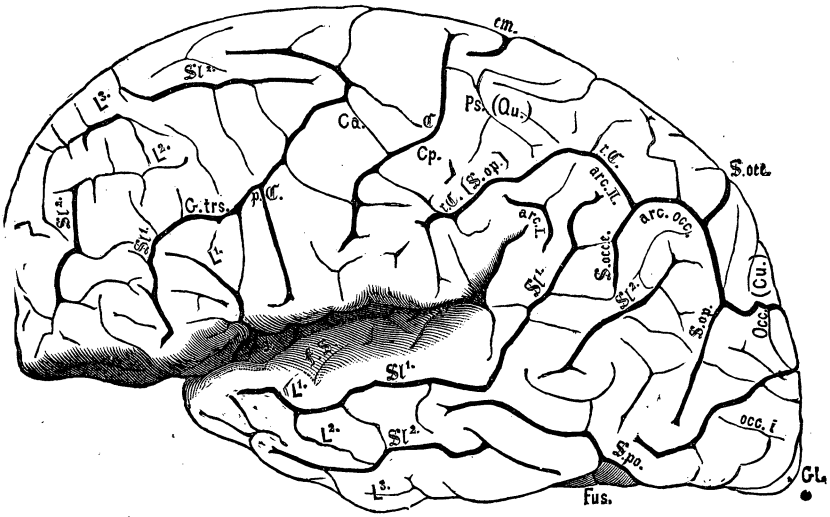


FIG. 1.—Convexity of the human brain. *J*, island of Reil; 𝔖, sylvian fissure. The letters are placed on the temporal lip of the fissure; above the island lies the operculum, bounded by the anterior ascending limb, which passes upward toward the letters 𝔖𝔩′, and the posterior ascending limb approaching the lettering *arc. I.* 𝔊, central fissure; 𝔭𝔊, præcentral fissure (anterior radial fissure); 𝔯𝔊, (𝔖.𝔬𝔭), postradial fissure (sulcus occipito-parietalis); 𝔖.𝔬𝔠𝔠, occipital fissure; 𝔖𝔩¹, 𝔖𝔩², longitudinal fissures in frontal and temporal lobes; 𝔖𝔩¹, designates below parallel fissure; 𝔖.𝔭𝔬, præoccipital fissure (fus gyrus fusiformis); *Ca*, anterior central convolutions; *Cp*, posterior central convolutions; *Ps* (*Qu*), superior parietal lobe (lobus quadratus); *arc I*, *arc II*, inferior and superior parietal convolutions; 𝔖.𝔬𝔠𝔠.𝔢, external occipital fissure (ape fissure); *Cu*, *Occ*, *Occ i*, the three occipital convolutions of Ecker; *Cu*, indicating the convex surface of the cuneus, and *Occ i* designating the convex surface of the gyrus lingualis; *Gl*, *em*, callosomarginal convolution; *arc.occ*, occipital arch; L^1 L^2 L^3, above 𝔉𝔖, frontal convolutions.

is that of Bell, "that the conduction of nerve force is in a centripetal direction through the posterior, and in a centrifugal direction through the anterior spinal roots." That cerebral function has definite locations is demonstrated by three facts among many others. The first of these is the intimate relation observed to

exist between the size of the olfactory lobe and the sense of

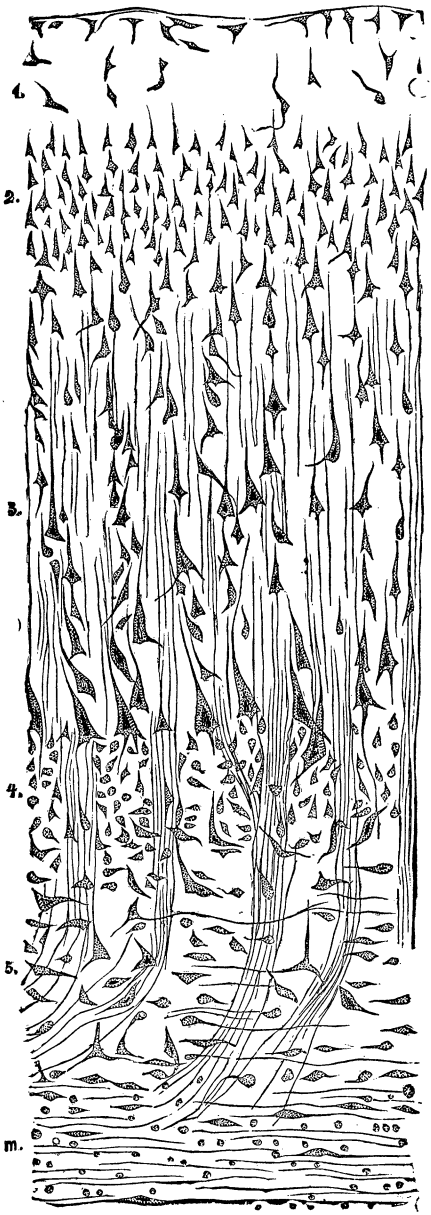


FIG. 2.—Section through the third longitudinal convolution of the frontal lobe adjoining a fissure. The fine layer type of the cerebral cortex. 1, superficial layer of neuroglia; 2, layer of small pyramids; 3, layer of large pyramids ("formation of the cornu ammonis"); 4, the granular layer; 5, the layer of spindle-shaped cells ("claustral formation"); *m*, medullary substance of the convolution.

smell; the second, the close relation between the size of the

olfactory lobes and the gyrus fornicatus, with which its fibers connect. This convolution is greatly developed in Mammalia with strong olfactory powers, forming with the external olfactory convolution the very extensive convexity of the cornu ammonis; thirdly, the direct connection which exists between diseases of the region about and within the sylvian fissure, especially the claustrum, and disorders of the faculty of speech. The experiments of Hitzig, Nothnagel, Ferrier and Munk receive due attention, and their curious results are given in detail.

Dr. Meynert's definition of the *ego* is interesting as proceeding from the physiological standpoint. He says (p. 16): "The sum of these [innervation] centers constitutes the 'individuality,' the 'ego' of abstract psychologists. I attach some importance to

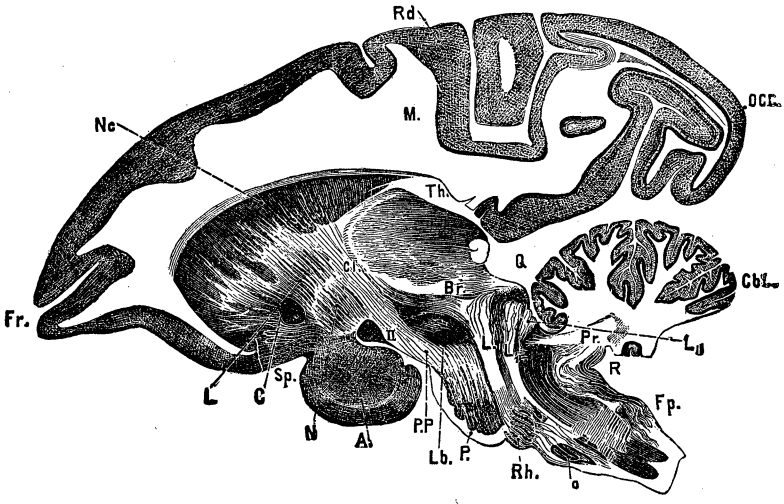


FIG. 3.—Transparent longitudinal section through the brain of a monkey. *Fr*, frontal end; *occ*, occipital end; *Rd*, cortex cerebri; *M*, medullary substance of the fore-brain; *Nc*, caudate nucleus; *L*, lenticular nucleus; *C*, anterior commissura; *N*, globus pallidus; *A*, amygdala; *II*, optic tract; *C.I*, internal capsule; *Th*, thalamus; *Br*, brachium corporis quadrigemini; *Lb*, discus lentiformis (by mistake of the engraver united to the stratum intermedium. The dark-pointed triangular mass in front of it is the radiation of the posterior longitudinal fasciculus. Underneath *Br* the radiation of the nucleus ruber); *L* L_I L_{II}, lemniscus of the superior and inferior corpus bigeminum, and of the valvula cerebelli; *P.P*, pes pedunculi; *P.* pons varolii; *Rh*, corpus rhomboideum; *O*, inferior olive; *Cbl*, cerebellum; *Pr*, processus cerebelli ad cerebrum; *R*, corpus restiforme; *Fp*, funiculus posterior.

the word 'individuality' because it is founded upon the anatomical structure of the cortex, and the simple physiological process which enters into our present discussion. Individuality implies the sum of firmest associations which under ordinary circumstances are well nigh inseparable; the aggregate of 'memories' forming a solid phalanx, the relation of which to conscious movements can be defined apparently with mathematical precision. This un-

equal activity of the fore-brain, constituting individuality, varies as regards contents and degree with each person; it is designated

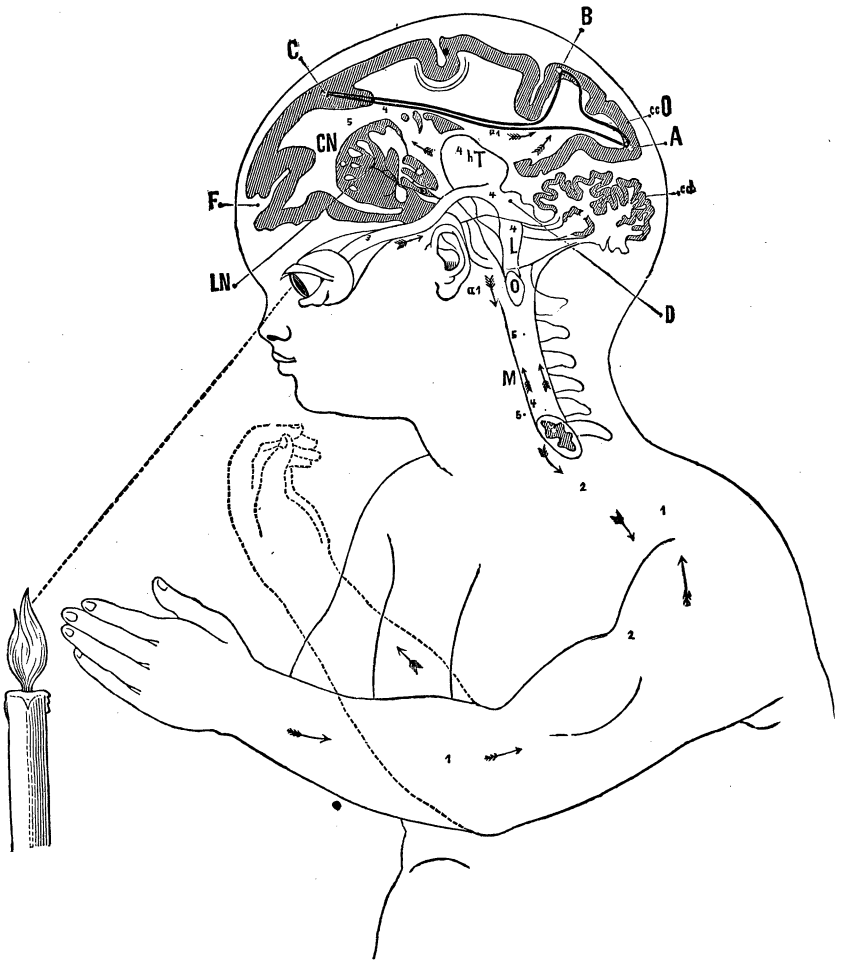


FIG. 4.—Diagram explaining the mechanism of a conscious movement of the arm. *F*, frontal cortex; *ccO*, occipital cortex; *C.N*, nucl. caud.; *L.N*, nucl. lenticularis; *hT*, thalamus opticus; *D*, mesen cephalon; *L*, pons variolii; *O*, med. oblongata, characterized by the olivary body; *M*, medulla spinalis, terminating with a cross-section of the cervical spinal cord; *cd*, cerebellum, blue lines indicate centripetal. red lines centrifugal tracts, the red and blue circles in the spinal cord and fore-brain denote central gray nuclei, black lines mark the association fibers; *1A*, sensory tract of the arm; *B*, part of the cortical center for cutaneous sensation; *2*, tract for effecting the movement of the arm; *3A*, conducting tract of the optic nerve: *A*, part of the visual center; *4C*, tract conducting sensation of innervation interrupted in the thalamus; *C*, a center in the cortex for sensations of innervation; *5*, centrifugally conducting tract originating in the cortical area *C*.

also as the character of each individual. It has been justly observed that if the character (individuality) of a person were entirely known, we would be able to predict the thoughts and deeds of such an individual, however complicated they might be."

On p. 170 it is pertinently remarked, that "there is no gap between conscious and reflex movements to be filled in by instinct."

Dr. Meynert makes the following reference to the nature and value of our cognitions (p. 183): "I wish to add that it is the boldest hypothesis, shared alike by the ordinary mind and by scientific realism, to assume that the world is such as it appears to the brain to be; that the latter can be likened to a mirror which simply reflects the forms of the outer world; that the world as it appears to the brain exists independently of the presence or absence of mind. Indeed, it seems to me to be a crucial test of an individual's power of thought to determine whether he can conceive or not of the unreality of the world clad in forms which our minds have bestowed upon it. It should be reiterated that the idealistic conception of the world is supported by physiological facts, and still more positively by the facts of cerebral architecture before alluded to." We cannot learn from this paragraph whether Dr. Meynert is an idealist in the Berkeleyan sense or not. In any case the pathological argument has a double edge. Perceptional and ideational incapacity, based on pathological conditions, no more prove the unreality (*i. e.*, immensurability) of the *non ego*, than the perfection of our cognitions enables us to perceive all there is of the world. Because we do not apprehend all, it is not to be inferred that we therefore apprehend nothing.

Dr. Meynert promises to discuss the important question of hereditary predisposition to mental disease in the second part of the work. He outlines his position on this question in the preface to Vol. I in the following language: "It is taking altogether too simple a view of things to regard morality as one of man's talents and as a definite psychical property which is present in some persons and lacking in others."—*C.*

ANTHROPOLOGY.[1]

THE ABORIGINAL AX OF THE SALT RIVER VALLEY, ARIZONA.—The fertile alluvial lands of the great valley of Salt river, which have been lying idle for unknown centuries, are now being rapidly redeemed by irrigation and planting. Phœnix, the "Garden City" of Arizona, now numbers some 5000 inhabitants, and is rapidly growing in population and wealth upon the ground which was formerly densely occupied by a race presumably extinct, unless it finds representation in the Pimos and Maricopas of to-day.

[1] Edited by Prof. OTIS T. MASON, National Museum, Washington, D. C.